c.) Amendments to the claims.

Please amend claims 7, 9-11, 15, 15, 22, 24, 27, 28, 31, 34-37, 39, 41, 42, 44, 46 and 51-55 as follows:

Claim 1. (original) A method for improving resolution of a two-dimensional image capable of being acquired from an object at a first pixel size, comprising:

defining a sampling region for producing said image at a second pixel size, said second pixel size being no larger than said first pixel size;

sampling, with an overlapping increment, said sampling region thereby producing a multiplicity of sample layers, said overlapping increment being no larger than said first pixel size thereby determining said second pixel size;

obtaining values of the pixels of the second pixel size in each of the multiplicity of sample layers;

computing the value of each pixel of said second pixel size from the values of the corresponding pixels in the multiplicity of the sample layers, thereby producing an intermediate image; and

dividing, in the Fourier domain, said intermediate image by a filtering function thereby producing said image at the second pixel size, said filter function being capable of representing artifacts from the multiple sampling.

Claim 2. (original) The method of claim 1, wherein said second pixel size is equal to said overlapping increment.

Claim 3. (original) The method of claim 1, wherein said second pixel size is equal to said first pixel size divided by said multiplicity.

Claim 4. (original) A method for improving resolution of a three-dimensional image capable of being acquired from an object at a first voxel size, comprising:

defining a sampling space for producing said image at a second voxel size, said second voxel size being no larger than said first voxel size;

sampling, with an overlapping increment, said sampling space thereby producing a multiplicity of sample areas, said overlapping increment being no larger than said first voxel size thereby determining said second voxel size;

obtaining values of the voxels of the second voxel size in each of the multiplicity of sample areas;

computing the value of each voxel of said second voxel size from the values of the corresponding voxels in the multiplicity of the sample areas, thereby producing an intermediate image; and

dividing, in the Fourier domain, said intermediate image by a filtering function thereby producing said image at the second voxel size, said filter function being capable of representing artifacts from the multiple sampling.

Claim 5. (original) The method of claim 4, wherein said second voxel size is equal to said overlapping increment.

Claim 6. (original) The method of claim 4, wherein said second voxel size is equal to said first voxel size divided by said multiplicity.

Claim 7. (currently amended) The method of claim 1 ~~or 4~~, wherein said filter function is a point response function.

Claim 8. (original) The method of claim 7, wherein said point response function is defined by a multiple sampling factor which is equal to said multiplicity.

Claim 9. (currently amended) The method of claim 1 ~~or 4~~, wherein the sampling is performed with an overlapping increment having a varied size.

Claim 10. (currently amended) The method of claim 1 ~~or 4~~, wherein the sampling is performed with an overlapping increment having a fixed size.

Claim 11. (currently amended) The method of claim 1, ~~4, 9, or 10,~~ wherein said overlapping increment is taken along one or more dimensions.

Claim 12. (original) The method of claim 11, wherein said overlapping increment is taken equally on one or more dimensions.

Claim 13. (original) The method of claim 11, wherein said overlapping increment is taken unequally on one or more dimensions.

Claim 14. (currently amended) The method of claim 12 ~~or 13~~, wherein said overlapping increment is taken angularly.

Claim 15. (currently amended) The method of claim 1 ~~or 4~~, wherein said overlapping increment is defined in terms of Cartesian coordinates or polar coordinates.

Claim 16. (original) A method for improving resolution of a two-dimensional image of an object from a plurality of images taken from said object at a first pixel size, wherein each image in said plurality is capable of overlaying one other images in said plurality at an increment, wherein said increment is no larger than said first pixel size, said method comprising:

defining a region for producing said two-dimensional image at a second pixel size, said second pixel size being determined by said increment;

obtaining values of the pixels of said second pixel size in each image in said plurality;

computing the value of each pixel of said second pixel size from the values of the corresponding pixels in the plurality, thereby producing an intermediate image; and

dividing, in the Fourier domain, said intermediate image by a filtering function thereby producing said two-dimensional image at the second pixel size, said filter function being capable of representing artifacts from the multiple overlaying.

Claim 17. (original) The method of claim 16, wherein each image in said plurality overlays one other image in said plurality at an increment having a fixed size and wherein said second pixel size is equal to said increment.

Claim 18. (original) The method of claim 16, wherein each image in said plurality overlays one other image in said plurality at an increment having a varied size and wherein said second pixel size is equal to the smallest of said increment.

Claim 19. (original) A method for improving resolution of a three-dimensional image of an object from a plurality of images taken from said object at a first voxel size, wherein each image in said plurality is capable of overlaying one other images in said plurality at an increment, wherein said increment is no larger than said first voxel size, said method comprising:

defining an area for producing said three-dimensional image at a second voxel size, said second voxel size being determined by said increment;

obtaining values of the voxels of said second voxel size in each image in said plurality;

computing the value of each voxel of said second pixel size from the values of the corresponding voxels in the plurality, thereby producing an intermediate image; and

dividing, in the Fourier domain, said intermediate image by a filtering function thereby producing said three-dimensional image at the second voxel size, said filter function being capable of representing artifacts from the multiple overlaying.

Claim 20. (original) The method of claim 19, wherein each image in said plurality overlays one other image in said plurality at an increment having a fixed size and wherein said second voxel size is equal to said increment.

Claim 21. (original) The method of claim 19, wherein each image in said plurality overlays one other image in said plurality at an increment having a varied size and wherein said second voxel size is equal to the smallest of said increment.

Claim 22. (currently amended) The method of claim 16 ~~or 19~~, wherein said filter function is a point response function.

Claim 23. (original) The method of claim 22, wherein said point response function is defined by a multiple overlaying factor which is equal to said plurality.

Claim 24. (currently amended) The method of ~~anyone of claims 16-21~~ claim 16, wherein said overlaying is performed along one or more dimensions.

Claim 25. (original) The method of claim 24, wherein said overlaying is performed equally on one or more dimensions.

Claim 26. (original) The method of claim 24, wherein said overlaying is performed unequally on one or more dimensions.

Claim 27. (currently amended) The method of claim 25 ~~or 26~~, wherein said overlaying is performed angularly.

Claim 28. (currently amended) The method of claim 16 ~~or 19~~, wherein said increment is defined in terms of Cartesian coordinates or polar coordinates.

Claim 29. (original) A method for producing a two-dimensional image of an object from multiple acquisitions using a two-dimensional acquisition matrix, wherein said acquisition matrix defines the resulting pixel size of said two-dimensional image, said method comprising:

acquiring, one at a time, a multiplicity of images from said object by shifting one or more units in said acquisition matrix;

obtaining values of the pixels in each image in said multiplicity;

computing the value of each pixel from the values of the corresponding pixels in the multiplicity, thereby producing an intermediate image; and

dividing, in the Fourier domain, said intermediate image by a filtering function thereby producing said two-dimensional image, said filter function being capable of representing artifacts from multiple acquisitions.

Claim 30. (original) A method for producing and transmitting a two-dimensional image of an object from multiple acquisitions using a two-dimensional acquisition matrix, wherein said acquisition matrix defines the resulting pixel size of said two-dimensional image, said method comprising:

acquiring, one at a time, a multiplicity of images from said object by shifting one or more units in said acquisition matrix;

transmitting, one at a time, said multiplicity of images;

obtaining values of the pixels in each transmitted image in said multiplicity;

computing the value of each pixel from the values of the corresponding pixels in the multiplicity, thereby producing an intermediate image; and

dividing, in the Fourier domain, said intermediate image by a filtering function thereby producing said two-dimensional image, said filter function being capable of representing artifacts from multiple acquisitions.

Claim 31. (currently amended) The method of claim ~~29 or~~ 30, wherein the resulting pixel size of said two-dimensional image is equal to the size of one or more units of said acquisition matrix.

Claim 32. (original) A method for producing a three-dimensional image of an object from multiple acquisitions using a three-dimensional acquisition matrix, wherein said acquisition matrix defines the resulting voxel size of said three-dimensional image, said method comprising:

acquiring, one at a time, a multiplicity of images from said object by shifting one or more units in said acquisition matrix;

obtaining values of the voxels in each image in said multiplicity;

computing the value of each pixel from the values of the corresponding voxels in the multiplicity, thereby producing an intermediate image; and

dividing, in the Fourier domain, said intermediate image by a filtering function thereby producing said three-dimensional image, said filter function being capable of representing artifacts from multiple acquisitions.

Claim 33. (original) A method for producing and transmitting a three-dimensional image of an object from multiple acquisitions using a three-dimensional acquisition matrix, wherein said acquisition matrix defines the resulting voxel size of said three-dimensional image, said method comprising:

acquiring, one at a time, a multiplicity of images from said object by shifting one or more units in said acquisition matrix;

transmitting, one at a time, said multiplicity of images;

obtaining values of the voxels in each transmitted image in said multiplicity;

computing the value of each voxel from the values of the corresponding voxels in the multiplicity, thereby producing an intermediate image; and

dividing, in the Fourier domain, said intermediate image by a filtering function thereby producing said two-dimensional image, said filter function being capable of representing artifacts from multiple acquisitions.

Claim 34. (currently amended) The method of claim ~~32 or~~ 33, wherein the resulting voxel size of said three-dimensional image is equal to the size of one or more units of said acquisition matrix.

Claim 35. (currently amended) The method of claim ~~29, 30, 32, or~~ 33, wherein said acquisition matrix comprises equally-spaced units.

Claim 36. (currently amended) The method of claim ~~29, 30, 32, or~~ 33, wherein said acquisition matrix comprises unequally-spaced units.

Claim 37. (currently amended) The method of claim ~~29, 30, 32, or~~ 33, wherein said acquisition matrix is defined in terms of reference coordinates.

Claim 38. (original) The method of claim 37, wherein said reference coordinates are Cartesian coordinates or polar coordinates.

Claim 39. (currently amended) The method of claim ~~29, 30, 32, or~~ 33, wherein images of said multiplicity of images are acquired at defined time points over a period of time.

Claim 40. (original) The method of claim 39, further comprising one or more preliminary test acquisitions for determining the scheduling of said time points.

Claim 41. (currently amended) The method of claim ~~29, 30, 32, or~~ 33, wherein said multiplicity of images are acquired, one at a time, by shifting a decimal number of units in said acquisition matrix.

Claim 42. (currently amended) The method of claim ~~29, 30, 32, or~~ 33, wherein said filter function is a point response function.

Claim 43. (original) The method of claim 42, wherein said point response function is defined by a multiple acquisition factor which is equal to said multiplicity.

Claim 44. (currently amended) The method of claim ~~29, 30, 32, or~~ 33, wherein said acquisition matrix is adaptively determined by adjusting the unit size or scheme for the subsequent acquisitions based on assessment of variance for one or more comparators for at least two prior acquisitions.

Claim 45. (original) The method of claim 44, wherein the one or more comparators are selected from the group consisting of pixel or voxel data, k-space data, phase data, and signal-to-noise ratio data.

Claim 46. (currently amended) The method of claim ~~29, 30, 32, or~~ 33, further comprising one or more preliminary test acquisitions for determining the unit size and scheme of said acquisition matrix.

Claim 47. (original) A method for transmitting a two-dimensional image of an object, said image having a first pixel size, the method comprising:

decomposing said image into a plurality of images taken from said object, each image in said plurality being capable of overlaying one other images in said plurality at an increment;

transmitting, one at a time, at least two images in said plurality;

computing the value of each pixel of an intermediate image from the values of the corresponding pixels in the transmitted images in said plurality; and

dividing, in the Fourier domain, said intermediate image by a filtering function thereby producing a resultant two-dimensional image having a second pixel size, said filter function being capable of representing artifacts from the multiple overlaying.

Claim 48. (original) The method of claim 47, wherein said second pixel size is equal to said first pixel size.

Claim 49. (original) A method for transmitting a three-dimensional image of an object, said image having a first voxel size, the method comprising:

decomposing said image into a plurality of images taken from said object, each image in said plurality being capable of overlaying one other images in said plurality at an increment;

transmitting, one at a time, at least two images in said plurality;

computing the value of each voxel of an intermediate image from the values of the corresponding pixels in the transmitted images in said plurality; and

dividing, in the Fourier domain, said intermediate image by a filtering function thereby producing a resultant two-dimensional image having a second voxel size, said filter function being capable of representing artifacts from the multiple overlaying.

Claim 50. (original) The method of claim 49, wherein said second voxel size is equal to said first voxel size.

Claim 51. (currently amended) The method of claim ~~47 or~~ 49, wherein said filter function is a point response function.

Claim 52. (currently amended) The method of claim ~~47 or~~ 49, wherein all images in said plurality is transmitted.

Claim 53. (currently amended) The method of ~~1, 16, 29, 30, or~~ 47, wherein said two-dimensional image is selected from the group consisting of a magnetic resonance image, an image produced by a digital scanner, a pathological image, a histological image, and a radiological image.

Claim 54. (currently amended) The method of ~~4, 19, 32, 33, or~~ 49, wherein said three-dimensional image is selected from the group consisting of a magnetic resonance image, an image produced by a digital scanner, an image produced by a digital camera or digital video, a pathological image, a histological image, and a radiological image.

Claim 55. (currently amended) The method of claim ~~1, 4, 16, 19, 29, 30, 32, 33, 47, or~~ 49, wherein the computing is performed by taking arithmetic means.